



State of Utah

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Department of
Environmental Quality

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DIVISION OF DRINKING WATER
Kenneth H. Bousfield, P.E.
Director

April 7, 2016

Kay Shurtz, Water Operator
Leamington Town
P.O. Box 38101
Leamington, UT 84638

Subject: **MPA Result Notification**, Upper and Lower Narrows **Spring Box #1** (WS002),
Leamington Town, System #14012, File #10386

The Division of Drinking Water (Division) suspected the Upper and Lower Narrows Spring Box #1 (identified as WS002 in the Division's inventory database) to be under the direct influence of surface water (UDI) based on the proximity of this spring collection area to the adjacent stream and a history of positive bacteriologic samples from this spring collection box immediately after the spring redevelopment.

Therefore, an initial microscopic particulate analysis (MPA) sample was collected from the Upper and Lower Narrows Spring Box #1 (WS002) on March 22, 2016. The MPA sample from Box #1 scored 1, which indicates a low risk for being UDI. Based on recent history of negative bacteriological samples from Spring Box #1 and the low-risk MPA sample, **Upper and Lower Narrows Spring Box #1 (WS002) is not currently considered to be UDI.**

The Division can reevaluate the source at any time if circumstances that affect its susceptibility to surface water change. For information about UDI and MPA sampling, see the attached *UDI Definition and Possible Causes*. If you have any questions regarding this letter, please contact me at (435) 896-5451 ext. 314 or Bernie Clark, of this office at (801) 536-0092.

Sincerely,

John L. Chartier, P.E.
Central District Engineer

Enclosures: MPA result

cc: Nathan Selin, Central Utah Public Health Department, nselin@utah.gov
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UDI Definition and Possible Causes

A groundwater source that is Under the Direct Influence of surface water (UDI) is vulnerable to contamination by pathogens found in surface water. This vulnerability could be because the sub-surface formation is not sufficiently filtering water as it percolates through the formation or because the groundwater collection device is poorly constructed and permits surface water to directly contaminate the ground water. The Division of Drinking Water determines and classifies a ground water source as UDI based on one or more of the following factors:

1. Geology and water flow conditions of the sub-surface formation
2. Construction of the groundwater collection device
3. Physical evidence of surface water intrusion or persistent water quality problems
4. Results of a microscopic particulate analysis (MPA) test
5. Water quality data showing surface water contamination (e.g. confirmed *E. coli* positive)

An MPA test (Item #4) consists of running the source water through a spiral-wound filter for a period of time. Particles collected by the filter are extracted in a laboratory, examined under a microscope, and identified. The particles indicate the risk that the water is contaminated by surface water. Particles that are expected to be found only above ground or in surface water indicate a risk of surface water contamination. Such indicators include chlorophyll-bearing algae, parts of flying insects, plant debris, *Cryptosporidium*, *Giardia*, etc. Some of these indicators are not pathogens, but their presence in the source water means it is susceptible to contamination by pathogens found in surface water.

An MPA sample is rated as having a low, moderate, or high risk of UDI if the score is 0-9, 10–19, or 20 and above, respectively. When basing the classification of a ground water source on MPA results, the Division classifies a source as UDI if any MPA sample is high risk or if any two MPA samples are moderate risk or above.

The path that surface water takes as it flows to a ground water source can and usually does vary with season and hydrological conditions. It is common for the flow path to be directly influenced by surface water under some conditions, such as during a high surface runoff during spring, but not to be directly influenced under others. So a surface-influenced source may have MPA sample results of various risk levels, depending on the timing of the sampling. A true ground water source that is not under the direct influence of surface water will always have only low-risk MPA samples.

ANALYSIS FOR WATERBORNE PARTICULATES

CH Diagnostic and Consulting Service, Inc.
512 5th Street, Berthoud, CO 80513
P: (970) 532-2078 F: (970) 532-3358

Invoice 20160193

Customer 20011292

State of Utah/Division of Drinking Water
P.O. Box 144830
Salt Lake City, UT 84114-4830
PWSID# Utah 14012

Laboratory Information

Federal Express; 3/24/2016; 1220 Hrs; 8.2°C; Wound
Results submitted by:

Mundel Luman
Laboratory Director 4/11/2016

Sample Identification: Leamington Town, Upper Narrows Spring #1, WS002

Sample Information: SOURCE: Spring; Unchlorinated

Sample Date & Time: 3/21/2016 05:00 PM → 3/22/2016 09:00 AM

Sampler: John Chartier

Amount: 3947.755 L (1043 gal)

Filter Color: Off white

Filter Type: Polypropylene wound cartridge

Date/Time Eluted: 3/25/2016 09:12 AM

Centrifugate: 0.00127 mL/100 L

RESULTS OF MICROSCOPIC PARTICULATE ANALYSIS

Amount of sample assayed: 240 L

Amorphous Debris	clay (1-2 µm), silt (2-50 µm), sand (50-2000 µm), inorganic precipitate, aggregates
Algae	ND
Diatoms	ND
Plant debris	ND
Rotifers	10/100 Gal
Nematodes	109/100 Gal
Pollen (pine)	2/100 Gal
Ameba	5/100 Gal, test
Ciliates	ND
Colorless Flagellates	ND
Crustaceans	3/100 Gal, some Copepod, Copepod nauplii
Other Arthropods	ND
Other	ND

Giardia and *Coccidia* are none detected (ND) by MPA unless reported under "Other".

This sample was analyzed for particulates following the Environmental Protection Agency Consensus Method for Determining Groundwaters Under the Direct Influence of Surface Water Using Microscopic Particulate Analysis (MPA). 1992. USEPA, Port Orchard, WA, EPA 910/9-92-029. All limitations stated in the methods apply. If HV capsule or foam filter was received, method was modified by filtering sample through a Pall Envirochek™ HV capsule or IDEXX Filta-Max™ filter at the sample site. If *Giardia* and *Cryptosporidium* Analysis was also performed, particulate extraction was modified.

COMMENTS: Score: 1-Low Risk per EPA Consensus Method referenced above.